



INVESTOR IN PEOPLE

The Patent Office
Concept House
Cardiff Road
Newport
South Wales
NP10 8QQ

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I also certify that the attached copy of the request for grant of a Patent (Form 1/77) bears an amendment, effected by this office, following a request by the applicant and agreed to by the Comptroller-General.


In accordance with the Patents (Companies Re-registration) Rules 1982, if a company named in this certificate and any accompanying documents has re-registered under the Companies Act 1980 with the same name as that with which it was registered immediately before re-registration save for the substitution as, or inclusion as, the last part of the name of the words "public limited company" or their equivalents in Welsh, references to the name of the company in this certificate and any accompanying documents shall be treated as references to the name with which it is so re-registered.

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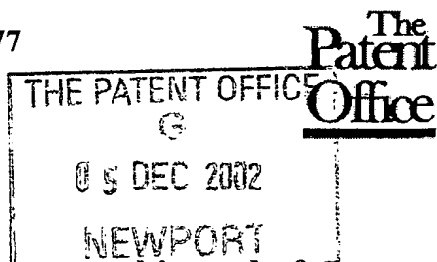
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Signed

Dated 30 June 2003



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APPLICANT: Andrew Charles RENSHAW
APPLICATION NO.: New U.S. Application
FILED: October 24, 2003
FOR: A SPROCKET
ATTORNEY DOCKET NO.: 116664



7/77

**Statement of inventorship and of
right to grant of a patent**

The Patent Office

Cardiff Road, Newport
South Wales NP9 1RH

1. Your reference	P650965 GB	
2. Patent application number (If you know it)	0228344.8	05 DEC 2002
3. Full name of the or of each applicant	RENTHAL LIMITED	
4. Title of the invention	A SPROCKET	
5. State how the applicant(s) derived the right from the inventor(s) to be granted a patent	BY VIRTUE OF SECTION 39(1) OF THE PATENTS ACT 1977, THE INVENTOR BEING AN EMPLOYEE OF THE APPLICANT.	
6. How many, if any additional Patents Form 7/77 are attached to this form? (see note (c))	-	
7.	<p>I/We believe that the person(s) named over the page (and on any extra copies of this form) is/are the inventor(s) of the invention which the above patent application relates to:</p> <p>Signature <u>Urquhart-Dykes & Lord</u> Date 04/12/02</p> <p>URQUHART-DYKES & LORD</p>	
8. Name and daytime telephone number of person to contact in the United Kingdom	R A BARKER 0161 832 9353	

Notes

- a) If you need help to fill in this form or you have any questions, please contact the Patent Office on 0645 500505.
- b) Write your answers in capital letters using black ink or you may type them.
- c) If there are more than three inventors, please write the names and addresses of the other inventors on the back of another Patents Form 7/77 and attach it to this form
- d) When an application does not declare any priority, or declares priority from an earlier UK application, you must provide enough copies of this form so that the Patent Office can send one to each inventor who is not an applicant
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Enter () full names, addresses and postcode of the inventors in the boxes and underline the surnames

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Patent ADP number (if you know it) 6837876002

Patent ADP number (if you know it)

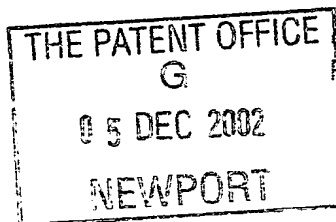
Reminder

Have you signed the form?

Patent ADP number (if you know it)

Request for grant of a patent

(see the notes on the back of this form. You can also get an explanatory leaflet from the Patent Office to help you fill in this form)



05DEC02 E768704-1 D02835
P01/7700 0.00-0228344.8
The Patent Office

Cardiff Road, Newport
South Wales NP9 1RH

1. Your reference

P650965 GB

2. Patent application number

(The Patent Office will fill in this part)

0228344.8

05 DEC 2002

3. Full name, address and postcode of the or of each applicant (underline all surnames)

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Patents ADP number (if you know it)

If the applicant is a corporate body, give the country/state of its incorporation

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4. Title of the invention

A SPROCKET

5. Name of your agent (if you have one)

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Patents ADP number (if you know it)

1644014

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (if you know it) the or each application number

Country

Priority application number
(If you know it)

Date of filing
(day/month/year)

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application

Date of filing
(day/month/year)

8. Is a statement of inventorship and or right to grant of a patent required in support of this request? (Answer "Yes" if:)

YES

a) any applicant named in part 3 is not an inventor, or
b) there is an inventor who is not named as an applicant, or
c) any named applicant is a corporate body;
see note (d)


9. Enter the number of sheets for any of the following items you are filing with this form.
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Continuation sheets of this form -

Description 3

Claim(s) 1

Abstract -

Drawing(s) 1 + 1 

- 10 If you are also filing any of the following items state how many against each item:

Priority documents -

Translation of priority documents -

Statement of inventorship and right to grant of a patent (patents form 7/77) 1 PLUS 1 COPY

Request for preliminary examination and search (patents form 9/77) 1

Request for substantive examination (patents form 10/77) -

Any other documents (please specify)

11

I/We request the grant of a patent on the basis of this application.

Signature

Date 04/12/02



URQUHART-DYKES & LORD

- 12 Name and daytime telephone number of person to contact in the United Kingdom

R A BARKER 0161 832 9353

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Notes

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- P650965 GB -

A SPROCKET

This invention concerns a sprocket, sometimes known as a chain wheel, for bicycles, motorcycles and similar wheeled vehicles.

Sprockets are conventionally formed in one piece as substantially circular discs of steel having teeth around the perimeter, and having various inner sections cut away to reduce weight. Since aluminium is light in weight, and many bicycle and motorcycle parts are made therefrom for this reason, it has recently been proposed to produce a sprocket by attaching a toothed steel annulus around the perimeter of a circular aluminium disc, the steel providing the necessary strength and wear resistance for the toothed perimeter. The aluminium disc and/or the steel annulus is provided with a series of projections or "ears" which overlie the other part and by means of which the parts are rivetted together. This has not proved to be satisfactory as the risk of the steel annulus detaching from the central aluminium disc after a period of use is too great and failure during use could prove fatal.

An object of this invention is to address this problem.

According to the invention a sprocket is provided comprising a disc of a first metal material having a substantially circular perimeter and an externally toothed annulus of a second metal material which is attached around the perimeter of the disc, in which respect the perimeter edge of the disc and an inner edge of the annulus are threadedly engaged.

In preferred practical embodiments the annulus and the disc are additionally connected by a pin which prevents relative rotation thereof and thereby prevents disengagement of their intermeshed threads.

The invention will be described further, by way of example, with reference to the accompanying drawing, in which:

Fig 1 is a side view of a practical embodiment of a sprocket in accordance with the invention; and

Fig 2 is a cross-section along line II-II in Fig 1, but showing five variations in thread size.

The exemplary sprocket comprises an annulus 10 of steel having conventionally formed teeth 12 around its outer edge. The inner diameter of this annulus 10 may be about 122mm. The sprocket further comprises a disc 14 of aluminium or an aluminium alloy which has an outer circular perimeter about 120mm in diameter. A large circular central aperture 16 is cut out of the disc 14,

so it is also annular. A number of other circular apertures 18 are cut out of the disc 14, as is customary, to reduce weight, while also creating an attractive pattern for the sprocket.

The steel annulus 10 is connected to the perimeter of the aluminium disc 14 by threaded interengagement. With reference to Fig 2, the disc and the annulus are both 6mm thick in this example. The outer edge of the disc 14 and the inner edge of the annulus 10 are formed with corresponding i.e. engagable, helical grooves to accomplish said threaded engagement. With a 6mm thickness, the number of helical turns may suitably be from 2 to 6, so that each thread has a thickness (pitch) between 3mm and 1mm. Fig 2 shows possible variants having 2, 2.5, 3, 4 and 5 helical turns. Obviously both the disc 14 and the annulus 10 must be formed with great precision so that a secure threaded engagement is accomplished.

Adhesive may also be used to secure the threaded connections between the outer annulus 10 and the central disc 14.

Finally, after the annulus 10 is threadedly connected to the disc 14, a single pin 20 is inserted across the line of the connection at one location to prevent any risk of the disc 14 disengaging.

The disc pattern and the dimensions may, of course, vary in other embodiments within the scope of the invention.

CLAIMS

1. A sprocket comprising a disc of a first metal material having a substantially circular perimeter and an externally toothed annulus of a second metal material which is attached around the perimeter of the disc, in which respect the perimeter edge of the disc and an inner edge of the annulus are threadedly engaged.
2. A sprocket as claimed in claim 1 wherein the annulus and the disc are additionally connected by a pin which prevents relative rotation thereof.
3. A sprocket as claimed in claim 1 or 2 wherein the perimeter edge of the disc and the inner edge of the annulus are each formed with from two to six turns of interengaging helical threads.
4. A sprocket substantially as hereinbefore described with reference to the accompanying drawing.

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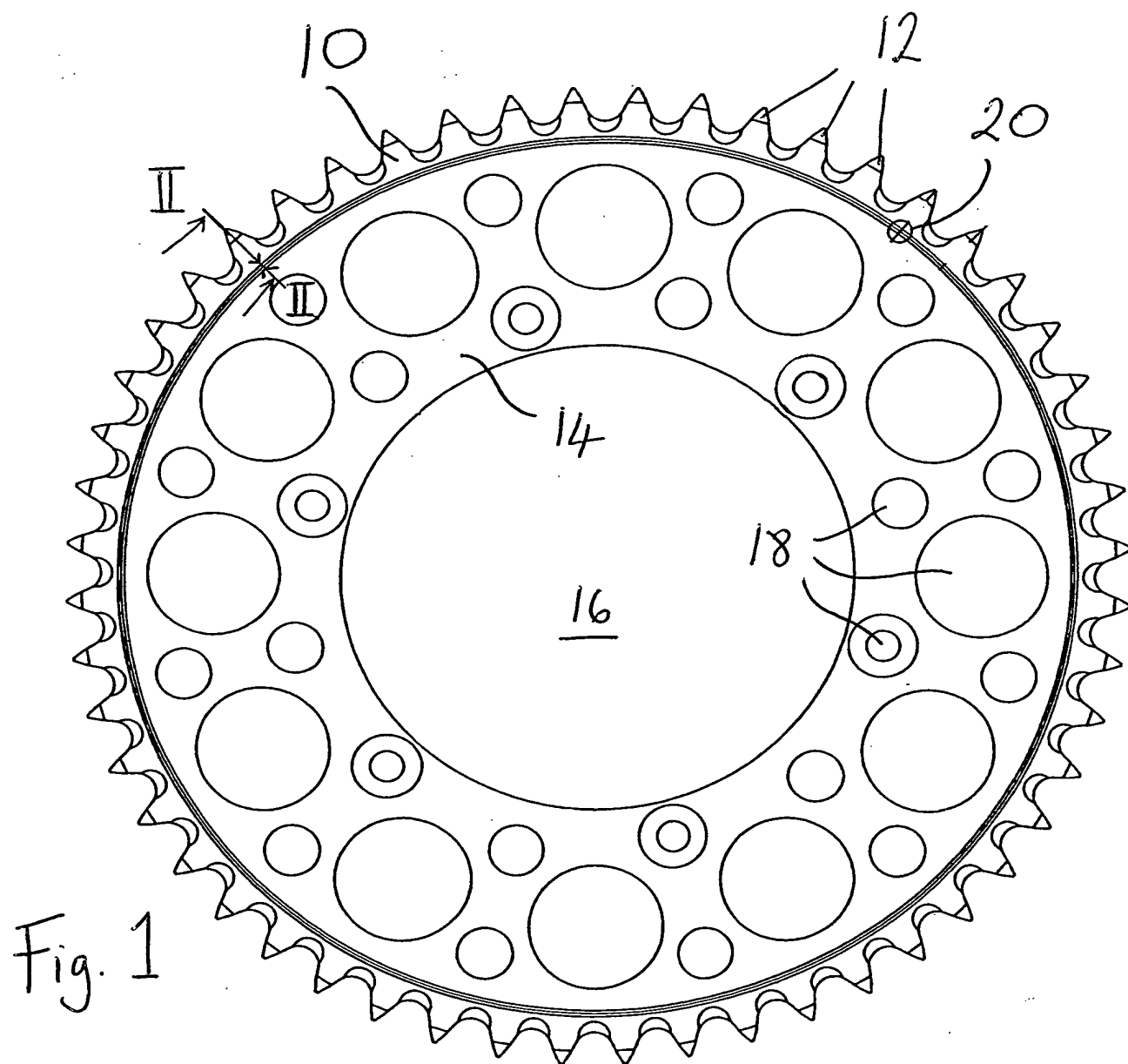


Fig. 1

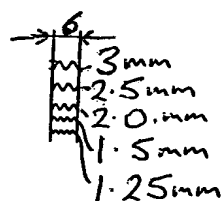


Fig. 2

